

What is claimed is;

1. A digital camera comprising:

an image-capturing device that captures a subject image having passed through a taking lens and outputs

5 image data;

a recording processing circuit that performs recording processing on image data; and

an image processing circuit that first performs pre-treatment on image data corresponding to N lines X M rows
10 output by said image-capturing device in units of individual lines in line sequence and then performs format processing appropriate for recording performed at said recording processing circuit on the image data having undergone said pre-treatment in units of blocks each
15 ranging over n lines X m rows ($N > n$, $M > m$) in block sequence.

2. A digital camera according to claim 1, wherein;

said recording processing circuit is constituted of a compression circuit that compresses the image data.

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3. A digital camera according to claim 1, wherein;

said pre-treatment includes gamma correction and white balance correction, and said format processing includes interpolation processing, LPF processing, BPF
25 processing and color difference signal calculation

processing.

4. A storage medium for image processing having a program stored therein that executes;

5 format processing in which image data of an image captured at an image-capturing device are formatted for recording;

 various types of pre-treatment implemented prior to said format processing; and

10 recording processing in which image data having undergone said format processing are recorded,

 during said pre-treatment, line sequence signal processing being performed on image data corresponding to N lines X M rows in units of individual lines and during
15 format processing, block sequence signal processing being performed on image data having undergone said pre-treatment in units of blocks each ranging over n lines X m rows ($N > n$, $M > m$).

20 5. A storage medium for image processing according to claim 4, wherein;

 said recording processing is compression processing in which the image data are compressed.

25 6. A storage medium for image processing according to

claim 4, wherein;

said pre-treatment includes gamma correction and white balance correction and said format processing includes interpolation processing, LPF processing, BPF
5 processing and color difference signal calculation processing.

7. A digital camera comprising;

an image-capturing device that captures a subject
10 image having passed through a taking lens and outputs image data;

a recording processing circuit that performs recording processing on image data; and

an image processing circuit that, with the image data
15 output by said image-capturing device input as data corresponding to n lines X m rows, calculates a color difference signal based upon the image data thus input, performs interpolation processing and low pass filtering processing simultaneously on said color difference signal
20 using filter coefficients for interpolation/low pass filtering and then performs matrix processing appropriate for recording performed at said recording processing circuit to generate a formatted signal.

25 8. A digital camera according to claim 7, wherein;

said recording processing circuit is constituted of a compression circuit that compresses the image data.

9. A storage medium for image processing having a
5 program stored therein that executes;

format processing to format image data of an image captured at an image-capturing device for recording, in which color difference signals corresponding to n lines \times m rows are calculated using image data that are input,
10 interpolation processing and low pass filtering processing are performed simultaneously on the color difference signals corresponding to n lines \times m rows using filter coefficients for interpolation/low pass filtering and then a formatted signal is generated by implementing matrix
15 processing; and

recording processing in which image data having undergone said format processing are recorded.

10. A storage medium for image processing according to
20 claim 9, wherein;

said recording processing is compression processing in which said image data are compressed.

11. A digital camera comprising;
25 an image-capturing device that captures a subject

image having passed through a taking lens and outputs image data;

an image processing circuit that performs image processing including data format processing appropriate
5 for data compression on the image data output by said image-capturing device; and

a compression circuit that compresses the image data output by said image processing circuit, wherein;

said image processing circuit engages in median
10 processing on image data corresponding to an $n \times m$ pixel area block during said format processing.

12. A digital camera according to claim 11, wherein;

said median processing is performed on $(n-i) \times (m-j)$
15 sets of image data extracted from the image data corresponding to said $n \times m$ pixel area.

13. A digital camera comprising;

an image-capturing device that captures a subject
20 image having passed through a taking lens and outputs image data; and

an image processing circuit that executes image processing in which median processing is performed on $(n-i) \times (m-j)$ sets of image data extracted from image data
25 corresponding to an $n \times m$ pixel area block for the image

data output by said image-capturing device.

14. A storage medium for image processing having a program stored therein that executes;

5 format processing in which image data of an image captured at an image-capturing device are formatted for compression;

 various types of signal processing implemented prior to said format processing; and

10 compression processing in which the image data having undergone said format processing are compressed,

 in said format processing, median processing being performed on image data corresponding to an $n \times m$ pixel area block.

15 15. A storage medium for image processing according to claim 14, wherein;

 said median processing is performed on $(n - i) \times (m - j)$ sets of image data extracted from the image data
20 corresponding to an $n \times m$ pixel area block.

16. A storage medium for image processing having a program stored therein, that executes median processing on $(n - i) \times (m - j)$ sets of image data extracted from image data
25 corresponding to an $n \times m$ pixel area block when

implementing a specific type of image processing on image data of an image captured at an image-capturing device.

17. A digital camera comprising;

5 an image-capturing device that captures a subject image having passed through a taking lens and outputs image data;

a white balance adjustment circuit that performs white balance adjustment on the image data output by said
10 image-capturing device;

a white balance fine adjustment coefficient calculation circuit that calculates white balance fine adjustment coefficients based upon image data having undergone white balance adjustment output by said white
15 balance adjustment circuit; and

a white balance fine adjustment circuit that performs white balance fine adjustment on the image data having undergone the white balance adjustment output by said white balance adjustment circuit using said white balance
20 fine adjustment coefficients.

18. A digital camera according to claim 17, wherein;

said white balance fine adjustment coefficient calculation circuit calculates average values of R, B and
25 G signals in the image data having undergone white balance

adjustment and calculates white balance fine adjustment coefficients based upon average values.

19. A digital camera according to claim 17, wherein;

5 said white balance fine adjustment coefficient calculation circuit calculates histograms of brightness levels of R, B and G signals in the image data having undergone white balance adjustment and calculates white balance fine adjustment coefficients based upon the
10 histograms.

20. A storage medium for image processing having a program stored therein that executes;

15 white balance adjustment processing in which white balance adjustment is performed on image data of an image captured at an image-capturing device;

20 white balance fine adjustment coefficient calculation processing in which white balance fine adjustment coefficients are calculated using image data having undergone white balance adjustment through said white balance adjustment processing; and

25 white balance fine adjustment processing in which white balance fine adjustment is performed on image data having undergone white balance adjustment using said white balance fine adjustment coefficients.

21. A storage medium for image processing according to claim 20, wherein;

in said white balance fine adjustment coefficient calculation processing, average values of R and B signals in the image data having undergone white balance adjustment are calculated and white balance fine adjustment coefficients are calculated based upon the average values.

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22. A storage medium for image processing according to claim 20, wherein;

in said white balance fine adjustment coefficient calculation processing, histograms of brightness levels of R, B and G signals in the image data having undergone white balance adjustment are calculated and white balance fine adjustment coefficients are calculated based upon the histograms.

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20 23. A digital camera comprising;

an image-capturing device that captures a subject image having passed through a taking lens and outputs image data;

a white balance adjustment circuit that performs white balance adjustment on the image data output by said

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image-capturing device;

an image area selection apparatus that selects one image area from a preset plurality of image areas;

a white balance fine adjustment coefficient

5 calculation circuit that calculates white balance fine adjustment coefficients based upon image data within an area set in relation to an image area selected by said image area selection apparatus, in image data having undergone white balance adjustment output by said white
10 balance adjustment circuit; and

a white balance fine adjustment circuit that performs white balance fine adjustment using said white balance fine adjustment coefficients calculated at said white balance fine adjustment coefficient calculation circuit.

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24. A digital camera according to claim 23, further comprising;

a focal point detection device that detects focal adjustment statuses relative to various subjects in a
20 preset plurality of focal white detection areas; and

a focal point detection area selection apparatus that selects one of said plurality of focal point detection areas based upon the focal adjustment statuses, wherein;

said image area selection apparatus selects image
25 data in an image area set in relation to the focal point

detection area selected by said focal point detection area selection apparatus.

25. A digital camera according to claim 23, wherein;

5 said white balance fine adjustment coefficient calculation circuit calculates average values of R, G and B signals in data in an image area selected by said image area selection apparatus after the white balance adjustment and calculates white balance fine adjustment
10 coefficients based upon the average values.

26. A digital camera according to claim 23, wherein;

 said white balance fine adjustment coefficient calculation circuit calculates histograms of brightness
15 levels of R, G and B signals in data in an image area selected by said image area selection apparatus after the white balance adjustment and calculates white balance fine adjustment coefficients based upon the histograms.

20 27. A storage medium for image processing having a program stored therein that executes;

 white balance adjustment processing in which white balance adjustment is performed on image data of an image captured at an image-capturing device;

25 image area selection processing in which an image

area is selected from a preset plurality of image areas;

white balance fine adjustment coefficient calculation processing in which white balance fine adjustment coefficients are calculated using image data within an
5 area set in relation to the image area selected through said image area selection processing; and

white balance fine adjustment processing in which white balance fine adjustment is performed on image data having undergone white balance adjustment using white
10 balance fine adjustment coefficients.

28. A storage medium for image processing according to claim 27, wherein;

in said image area selection processing, information
15 related to a focal point detection area from which a focal adjustment status used for a focus matching operation at a taking lens has been detected among a preset plurality of focal point detection areas is used as a basis for selecting an image area related to said focal point
20 detection area.

29. A storage medium for image processing according to claim 27, wherein;

in said white balance fine adjustment coefficient
25 calculation processing, average values of R, G and B

signals in image data in an image area selected through
said image area selection processing after the white
balance adjustment are calculated and white balance fine
adjustment coefficients are calculated based upon the
5 average values.

30. A storage medium for image processing according to
claim 27, wherein;

10 in said white balance fine adjustment coefficient
calculation processing, histograms of brightness levels of
R, G and B signals in image data in an image area selected
through said image area selection processing after the
white balance adjustment are calculated and white balance
fine adjustment coefficients are calculated based upon the
15 histograms.

31. A carrier wave encoded to transmit a control program
for white balance adjustment on image data ,the
control program including instructions for;

20 white balance adjustment processing in which white
balance adjustment is performed on image data of an image
captured at an image-capturing device;

image area selection processing in which an image
area is selected from a preset plurality of image areas;
25 white balance fine adjustment coefficient calculation

processing in which white balance fine adjustment coefficients are calculated using image data within an area set in relation to the image area selected through said image area selection processing; and

5 white balance fine adjustment processing in which white balance fine adjustment is performed on image data having undergone white balance adjustment using white balance fine adjustment coefficients.

10 32. A carrier wave according to claim 31, wherein;
 in said image area selection processing, information related to a focal point detection area from which a focal adjustment status used for a focus matching operation at a taking lens has been detected among a preset plurality of
15 focal point detection areas is used as a basis for selecting an image area related to said focal point detection area.

 33. A carrier wave according to claim 31, wherein;
20 in said white balance fine adjustment coefficient calculation processing, average values of R, G and B signals in image data in an image area selected through said image area selection processing after the white balance adjustment are calculated and white balance fine
25 adjustment coefficients are calculated based upon the

average values.

34. A carrier wave according to claim 31, wherein;

in said white balance fine adjustment coefficient
5 calculation processing, histograms of brightness levels of
R, G and B signals in image data in an image area selected
through said image area selection processing after the
white balance adjustment are calculated and white balance
fine adjustment coefficients are calculated based upon the
10 histograms.

35. An electronic camera comprising:

an image-capturing device;
a first signal processing unit that performs, at
15 least, A/D conversion on an image signal generated by said
image-capturing device to convert the image signal to
digital image data;

a second signal processing unit that performs
irreversible signal processing on the image data resulting
20 from conversion at said first signal processing unit;

an image memory capable of temporarily storing the
image data; and

an operation control unit that dynamically selects a
signal path between said two signal processing units in
25 correspondence to an operation mode set to either (1) or

(2) below:

(1) a fast mode, in which a sequence of signal processing operations is executed continuously by providing an output from said first signal processing unit
5 to said second signal processing unit and engaging said two signal processing units in synchronous operation;

(2) an original image mode, in which an output from said first signal processing unit is stored in said image memory, image data read out from said image memory are
10 provided to said second signal processing unit and said two signal processing units are made to engage in operations, each performed with a timing different from the timing of the other.

15 36. An electronic camera according to claim 35, wherein:

said operation control unit utilizes a "storage area in said image memory provided to store the output from said first signal processing unit in said original image mode" as a buffer area for keeping in retreat image data
20 undergoing processing in said fast mode.

37. An electronic camera according to claim 35, wherein:

said operation control unit accepts an external operation indicating whether or not raw data (image data
25 yet to undergo irreversible signal processing performed by

said second signal processing unit) are required, selects and executes said fast mode if the operation indicates that no raw data are required and selects and executes said original image mode if the operation indicates that raw data are required to output to an outside (or to store in a recording medium) raw data present in said image memory.

38. An electronic camera according to claim 35, wherein:

said operation control unit sets an operation clock of said second signal processing unit faster than an operation clock of said first signal processing unit in said original image mode.

39. An electronic camera according to claim 35, wherein:

said second signal processing unit performs, at least, either "irreversible gradation conversion" or "irreversible pixel thinning."